CLAIMS.

1. An imaging agent which comprises a synthetic caspase-3 inhibitor labelled with an imaging moiety, wherein the caspase-3 inhibitor has a K_i for caspase-3 of less than 2000 nM, and wherein following administration of said labelled caspase-3 inhibitor to the mammalian body *in vivo*, the imaging moiety can be detected either externally in a non-invasive manner or *via* use of detectors designed for use *in vivo*

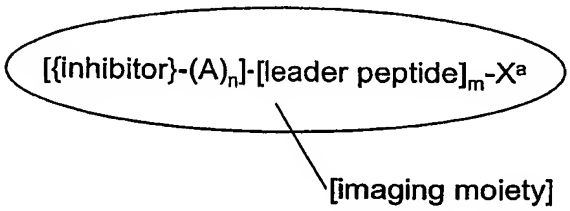
2. The imaging agent of Claim 1, where the synthetic caspase-3 inhibitor has a K_i for caspase-3 of less than 500 nM.

3. The imaging agent of Claims 1 or 2, where the synthetic caspase-3 inhibitor has a molecular weight of 150 to 3000 Daltons.

4. The imaging agent of Claims 1 to 3, where the imaging moiety comprises:
   (i) a radioactive metal ion;
   (ii) a paramagnetic metal ion;
   (iii) a gamma-emitting radioactive halogen;
   (iv) a positron-emitting radioactive non-metal;
   (v) a hyperpolarised NMR-active nucleus;
   (vi) an optical dye suitable for *in vivo* imaging.

5. The imaging agent of claims 1 to 4, which further comprises a 4 to 20-mer leader peptide sequence, wherein said leader peptide facilitates cell membrane transport from the outside to the inside of a mammalian cell *in vivo*.

6. The imaging agent of Claim 5 where the synthetic caspase-3 inhibitor conjugate is of Formula I:



(Formula I)

where:

{inhibitor} is the caspase-3 inhibitor of claims 1 to 3;

[leader peptide] is as defined in Claim 4 and is attached by either its' amine or carboxyl terminus;

$-(A)_n-$ is a linker group wherein each A is independently $-CR_2-$, $-CR=CR-$, $-C\equiv C-$, $-CR_2CO_2-$, $-CO_2CR_2-$, $-NRCO-$, $-CONR-$, $-NR(C=O)NR-$, $-NR(C=S)NR-$, $-SO_2NR-$, $-NRSO_2-$, $-CR_2OCR_2-$, $-CR_2SCR_2-$, $-CR_2NRCR_2-$, a C_{4-8} cycloheteroalkylene group, a C_{4-8} cycloalkylene group, a C_{5-12} arylene group, or a C_{3-12} heteroarylene group, an amino acid or a monodisperse polyethyleneglycol (PEG) building block;

R is independently chosen from H, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxyalkyl or C_{1-4} hydroxyalkyl;

n is an integer of value 0 to 10,

m is 0 or 1;

and X^a is H, OH, Hal, NH_2, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkoxyalkyl, C_{1-4} hydroxyalkyl or X^a is the imaging moiety.

7. The imaging agent of Claims 1 to 6, where the radioactive metal ion is a gamma emitter or a positron emitter.

8. The imaging agent of Claim 7, where the radioactive metal ion is ^{99m}Tc, ^{111}In, ^{64}Cu, ^{67}Cu, ^{67}Ga or ^{68}Ga.

9. The imaging agent of Claims 1 to 6, where the paramagnetic metal ion is Gd(III), Mn(II) or Fe(III).

10. The imaging agent of Claims 1 to 6, where the gamma-emitting radioactive halogen is ^{123}I.

11. The imaging agent of Claims 1 to 6, where the positron-emitting radioactive non-metal is chosen from ^{18}F, ^{11}C, ^{124}I or ^{13}N.

12. The imaging agent of Claims 1 to 11, where the synthetic caspase-3 inhibitor comprises one or more of the caspase-3 inhibitors defined in (i) to (ix):

(i) a tetrapeptide derivative of Formula III

$$Z^1\text{-Asp-Xaa1-Xaa2-Asp-}X^1 \quad \text{(III)}$$

where Z^1 is a metabolism inhibiting group attached to the N-terminus of the tetrapeptide;

Xaa1 and Xaa2 are independently any amino acid;

X^1 is an $-R^1$ or $-CH_2OR^2$ group attached to the carboxy terminus of the tetrapeptide;

where R^1 is H, $-CH_2F$, $-CH_2Cl$, C_{1-5} alkyl, C_{1-5} alkoxy or $-(CH_2)_qAr^1$, where q is an integer of value 1 to 6 and Ar^1 is C_{6-12} aryl, C_{5-12} alkyl-aryl, C_{5-12} fluoro-substituted aryl, or C_{3-12} heteroaryl;

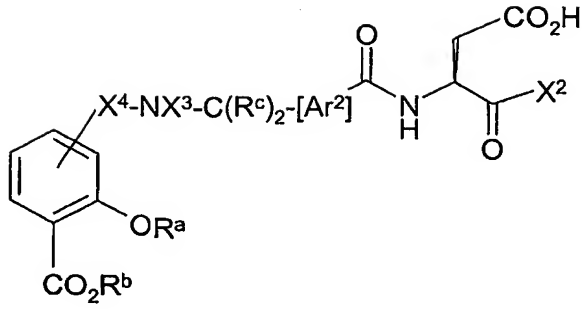
R^2 is C_{1-5} alkyl, C_{1-10} acyl or Ar^1;

(ii) a quinazoline or anilinoquinazoline;

(iii) a 2-oxindole sulphonamide;

(iv) an oxoazepinoindoline;

(v) a compound of Formula IV



(IV)

where X^2 is H, C_{1-5} alkyl or $-(CH_2)_r-(S)_s-(CH_2)_tAr^3$, where r and t are integers of value 0 to 6, s is 0 or 1 and Ar^3 is C_{6-12} aryl, C_{5-12} alkyl-substituted aryl, C_{5-12} halo-substituted aryl, or C_{3-12} heteroaryl;

Ar^2 is C_{6-12} aryl or C_{3-12} heteroaryl;

X^3 is an R^b group;

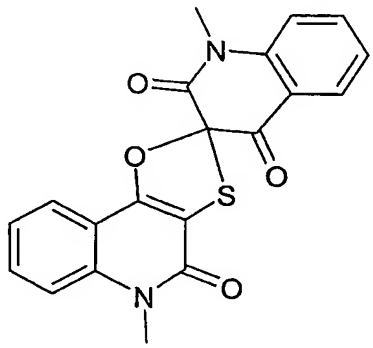
X^4 is $-SO_2-$ or $-CR_2-$

R^a is H, C_{1-5} alkyl or P^{GP} where P^{GP} is a protecting group;

R^b is an R^a group or C_{1-5} acyl;

each R^c is independently H or C_{1-5} alkyl;

(vi) a compound of Formula V



(V)

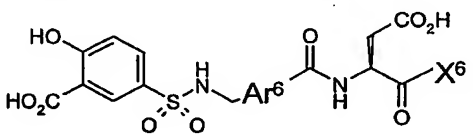
(vii) a pyrazinone;

(viii) a dipeptide of Formula VI:

Z^1-Val-Asp-CH_2-S-R^1 (VI)

where the -CH_2SR^1 group is attached to the carboxy terminus of the dipeptides, and Z^1 and R^1 are as defined for Formula (III);

(ix) a salicylic acid sulphonamide of Formula XI:



Formula XI

Where Ar^6 is a 5 or 6-membered C $_{4-6}$ aryl or heteroaryl ring, and X6 is H or $-CH_2SR^2$, where R2 is as defined above.

13. The imaging agent of Claim 12, where the synthetic caspase-3 inhibitor comprises:

(i) a tetrapeptide of Formula III; or

(ii) a 2-oxindole sulphonamide; or

(iii) a dipeptide of Formula VI.

14. The imaging agent of Claims 1 to 13, where the synthetic caspase-3 inhibitor is selective for caspase-3 over caspase-1, by a factor of at least 50.

15. The imaging agent of Claims 13 or 14, where the synthetic caspase-3 inhibitor comprises a tetrapeptide of Formula III or a dipeptide of Formula VI.

16. A pharmaceutical composition which comprises the imaging agent of claims 1 to 15 together with a biocompatible carrier, in a form suitable for mammalian administration.

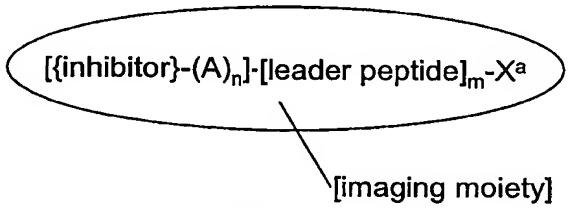
17. A radiopharmaceutical composition which comprises the imaging agent of claims 1 to 15 wherein the imaging moiety is radioactive, together with a biocompatible carrier, in a form suitable for mammalian administration.

18. The radiopharmaceutical composition of claim 17, where the imaging moiety comprises a positron-emitting radioactive non-metal or a gamma-emitting radioactive halogen.

19. The radiopharmaceutical composition of claim 17, where the imaging moiety comprises a radioactive metal ion.

20. A conjugate of a synthetic caspase-3 inhibitor with a ligand, wherein the caspase-3 inhibitor has a K_i for caspase-3 of less than 2000 nM, and wherein said ligand is capable of forming a metal complex with a radioactive or paramagnetic metal ion.

21. The conjugate of Claim 20, of Formula Ib:



(Ib)

where A, n, m and X^a are as defined in Claim 6.

22. The conjugate of Claims 20 or 21, wherein the ligand is a chelating agent.

23. The conjugate of Claim 22, wherein the chelating agent has a diaminedioxime, N_2S_2, or N_3S donor set.

24. A kit for the preparation of the radiopharmaceutical composition of Claim 19, which comprises the conjugate of Claims 20 to 23.

25. The kit of Claim 24, where the radioactive metal ion is ^{99m}Tc, and the kit further comprises a biocompatible reductant.

26. A kit for the preparation of the radiopharmaceutical composition of Claim 18, which comprises a precursor, said precursor being a non-radioactive derivative of the caspase-3 inhibitor of claims 1 to 15, wherein said non-radioactive derivative is capable of reaction with a source of the positron-emitting radioactive non-metal or gamma-emitting radioactive halogen to give the desired radiopharmaceutical.

27. The kit of claim 26 where the precursor is in sterile, apyrogenic form.

28. The kit of Claims 26 or 27, where the source of the positron-emitting radioactive non-metal or gamma-emitting radioactive halogen is chosen from:

(i) halide ion or F^+ or I^+; or

(ii) an alkylating agent chosen from an alkyl or fluoroalkyl halide, tosylate, triflate or mesylate;

29. The kit of Claims 26 to 28, where the non-radioactive derivative is chosen from:

(i) an organometallic derivative such as a trialkylstannane or a trialkylsilane;

(ii) a derivative containing an alkyl halide, alkyl tosylate or alkyl mesylate for nucleophilic substitution;

(iii) a derivative containing an aromatic ring activated towards nucleophilic or electrophilic substitution;

(iv) a derivative containing a functional group which undergoes facile alkylation;

(v) a derivative which alkylates thiol-containing compounds to give a thioether-containing product.

30. The kit of claims 26 to 29, where the precursor is bound to a solid phase.

31. Use of the imaging agent of claims 1 to 15 in a method of diagnosis of a caspase-3 implicated disease state of the mammalian body, wherein said mammal is previously administered with the pharmaceutical composition of claim 16, or the radiopharmaceutical composition of claims 17 to 19.